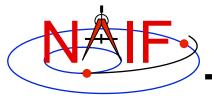


Navigation and Ancillary Information Facility

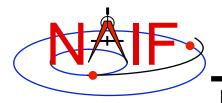
SPICE Development Plans and Possibilities

March 2010





- Work in progress
- Future possibilities
- Your suggestions?



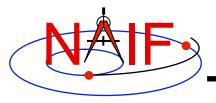
Work In Progress

Navigation and Ancillary Information Facility

- Extension of the shape model subsystem
 - The task is to add two new shape model capabilities:
 - » plate model, for small, irregularly shaped bodies, and
 - » digital elevation model

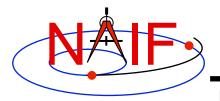
to the existing tri-axial shape model found in PCK

- Status
 - » A prototype of the plate model has been given to several projects
 - » Work was on hold for quite some time due to JNISpice task
 - » Work has now resumed, but there is a long way to go
 - » The prototype plate model interfaces will change somewhat
 - » Dates for release of "alpha-test" and "final" versions are unknown



New Language Interfaces

- Java Native Interface (JNISpice)
 - An alpha-test release was made in February, 2010
 - Official addition to the Toolkit later this year (date is TBD)
- Python
 - Considerable prototyping has been done
 - Whether or not this effort will proceed, and when, is uncertain



Other Possibilities - 1

- Provide a GUI tool that will contrast a set of SPK files, thus aiding you in selecting the one(s) of interest
- Provide a GUI tool for easier creation of a SPICE frame, and visualization thereof
- Provide a "predict spk" tool that makes it easy to construct an SPK file from simple rules
- Add more high-level computations, such as instrument footprint coverage
- Star catalog integrated with SPICE capabilities



Other Possibilities - 2

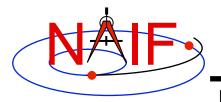
Navigation and Ancillary Information Facility

Java/Spice Interface test ernels Computations Drawings Log	
[llumination Angles	"GEOCALC"
Target	Marš
Observer	MEX
Surface point longitude	114.786907 <u>ĭ</u>
Surface point latitude	-14.773171 <u>)</u>
Observation epoch	2004 Jan 4 08:52:00.707724
Abernation Correction	Coordinate System
¢ NONE	Planetocentric
	↓ Planetodetic
♦ NONE ↓ LT	 ◆ Planetocentric ◇ Planetodetic
erver MEX rration correction NONE	
ime 2004 Jan 4 (urface planetocentric longitude (deg) urface planetocentric latitude (deg)	08:52:00.707724 114.786907 -14.773171
hase angle (deg) olar incidence angle (deg) mission angle (deg)	37.317459 37.317454 0.000007

Provide a GUI interface to a limited set of SPICE computations.

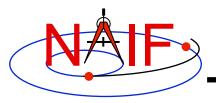
In this example, compute the illumination angles on Mars at LON 114.7 and LAT -14.7 as seen from Mars Express on 2004 JAN 4 08:52:00. The user can pick either a planetocentric or planetodetic reference frame.

Plans and Possibilities for Further Development



Still Other Possibilities?

- Additional target models: rings, gravity, atmosphere, magnetosphere, ...
- Develop a more flexible and extensible instrument modeling mechanism



What do You Suggest?

- NAIF solicits suggestions from the user community.
 - Caution: we're a small team and have a large backlog, so we can't promise any particular action.
- We're interested in programmatic ideas as well as technical ones.
 - Should NAIF promote use of SPICE beyond NASA's planetary science program?
 - What amount of cooperation and interoperability with foreign partners is appropriate and achievable?